REMARKS

Claims 1-23 are pending in this application. Claim 2 is amended. Claims 1 and 20 are cancelled. Support for the amendments is found throughout the specification and the drawings. In view of the following amendments and remarks, Applicants respectfully request reconsideration of the application.

I. Rejections Under 35 U.S.C. § 102

Claims 1-5 have been rejected under 35 U.S.C. § 102(b) as anticipated by EP 0964608 A2 to Meyer, et al. ("Meyer"). Applicants respectfully traverse.

According to the Examiner, with respect to claim 1, Meyer teaches a soldering method including providing two circuits with at least one trace each, placing solder on at least one of the circuits, placing the two circuits in alignment, and using a laser beam to melt and fuse the solder. Claim 1 has been cancelled, therefore this rejection is moot.

Furthermore, with respect to claim 2, the Examiner claims that Meyer teaches a laser beam that is redirected, which, according to the Examiner, means that the beam moves across the circuit. Claim 2 contains the limitation that the laser beam moves across the flex circuits. Meyer, column 3, lines 46-48, discusses a laser beam which is stationary during application of beam energy to the contact trace, and is then moved after the contact is fused. The beam is turned off or redirected after fusing. It does not disclose the limitation in claim 2 wherein the laser beam itself moves during application of beam energy to the contact trace being fused. not claimed The direction of the laser beam is not changed in the present application, rather the laser beam is moved across the substrate while maintaining a consistent direction. Claim 2 has been amended to independent form to include the limitations of claim 1. Support for this amendment can be found

throughout the specification and the amended claim. Since the description in Meyer actually recites the extra step of changing the direction of the beam and/or turning it off, it does not disclose the unique arrangement described in amended claim 2, and therefore, it cannot anticipate claim 2.

Furthermore, there is no suggestion in Meyer to modify the device of Meyer to meet each and every limitation claimed in amended claim 2. As previously mentioned, Meyer discloses the extra step of changing the direction of the laser beam and/or turning it off. This extra step actually teaches away from the continuous movement of the laser beam described in amended claim 2. (See page 5, lines 18-32 through page 6, lines 1-7).

Claims 3-5 are dependent on amended claim 2, which is believed to be allowable, therefore claims 3-5 are also believed to be allowable. Therefore, Applicants respectfully request that the § 102 rejections of claims 2-5 be withdrawn.

II. Rejections Under 35 U.S.C. § 103

A. Claims 6-15

Claims 6-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Meyer as applied to claims 1-5 and further in view of U.S. Pat. No. 6,333,483 to Ueno ("Ueno").

With respect to claim 6, the Examiner stated that Meyer is silent as to laser beam shape, and that Ueno teaches reflowing solder cream with a laser, which desirably has a shape that matches that of the pad as closely as possible. The Examiner claims that it would have been obvious to modify Meyer by using a rectangularly shaped laser

beam because Ueno teaches that this is desirable if the pad is rectangular. Applicants respectfully traverse.

Claim 6 is dependent on amended claim 2, which is believed to be allowable. Therefore, claim 6 is allowable. Furthermore, even if Meyer and Ueno were combined, and the laser beam was modified to have a rectangular shape, they would not disclose each and every element claimed in claim 6, as claim 6 incorporates each and every limitation of amended claim 2 and all intervening claims. Claim 2, as amended, is allowable, as discussed above. Applicants respectfully request that the rejection of claim 6 under § 103(a) be withdrawn.

With respect to claim 7, the Examiner claims that Meyer teaches that the substrate should allow as much as 95% of the laser energy to pass through. Applicants respectfully traverse. Claim 7 is dependent on amended claim 2, which is believed to be allowable. Therefore, claim 7 is allowable. Furthermore, even if Meyer and Ueno were combined, they would not disclose each and every element claimed in claim 7, as claim 7 incorporates each and every limitation of amended claim 2 and all intervening claims. Claim 2, as amended, is allowable, as discussed above. Applicants respectfully request that the rejection of claim 7 under § 103(a) be withdrawn.

With respect to claims 8 and 9, the Examiner claims that the solder paste may be deposited by any conventional means, including the use of a stencil to print the paste, which would make it obvious to use a stencil between the two circuits. Also, with respect to claim 9, the Examiner claims that stenciling conventionally works to apply solder by having a solder mask that does not cover the areas to be joined, and the Examiner claims that this means that the solder paste is deposited in an area not

covered by a mask. Applicants respectfully traverse. Claims 8 and 9 are dependent on amended claim 2, which is believed to be allowable. Therefore, claims 8 and 9 are allowable. Furthermore, even if Meyer and Ueno were combined, they would not disclose each and every element claimed in claims 8 and 9, as claims 8 and 9 incorporate each and every limitation of amended claim 2 and all intervening claims. Claim 2, as amended, is allowable, as discussed above. Applicants respectfully request that the rejection of claims 8 and 9 under § 103(a) be withdrawn.

With respect to claims 10-12, the Examiner claims that Meyer teaches that the laser energy is directed to the mounting pads to melt the solder paste and join the pads with a solid solder joint. Applicants respectfully traverse. Claims 10-12 are dependent on amended claim 2, which is believed to be allowable. Therefore, claims 10-12 are allowable. Furthermore, even if Meyer and Ueno were combined, they would not disclose each and every element claimed in claims 10-12, as claims 10-12 incorporate each and every limitation of amended claim 2 and all intervening claims. Claim 2, as amended, is allowable, as discussed above. Applicants respectfully request that the rejection of claims 10-12 under § 103(a) be withdrawn.

With respect to claims 13-15, the Examiner claims that Meyer teaches that several laser beams may be used simultaneously and that these beams need not all be perpendicular to the surface. Applicants respectfully traverse. Claims 13-15 are dependent on amended claim 2, which is believed to be allowable. Therefore, claims 13-15 are allowable. Furthermore, even if Meyer and Ueno were combined, they would not disclose each and every element claimed in claims 13-15, as claims 13-15 incorporate each and every limitation of amended claim 2 and all intervening claims.

Claim 2, as amended, is allowable, as discussed above. Applicants respectfully request that the rejection of claims 13-15 under § 103(a) be withdrawn.

B. Claims 16-19

Claims 16-18 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Meyer in view of U.S. Pat. No. 5,021,630 to Benko et al. ("Benko"). The Examiner claims that Meyer teaches a soldering method including providing two circuits with at least one trace each, placing solder on at least one of the circuits, placing the two circuits in alignment, and using a laser beam to melt and fuse the solder. As previously stated, the Examiner believes that the term "redirected," as disclosed by Meyer, means that the beam is moving across the circuit. The Examiner admits that Meyer does not specifically teach moving the beam during solder reflow. The Examiner claims that Benko teaches laser soldering where a laser is directed across a row of bond pads to join leads to the bond pads, and that it would be obvious to modify the method of Meyer by moving the laser beam across areas to be joined by solder because Benko demonstrates this as an art-recognized method to laser solder multiple joints effectively. Applicants respectfully traverse.

As described in reference to claims 2-15, claim 16 also similarly contains the limitation that a laser beam be moved from one point relative to the first flex circuit across the flex circuit to cause the solder to reflow. The Examiner admitted that Meyer does not teach moving the laser beam during reflow. Furthermore, while Benko describes a beam directed across a row of bond pads, there is nothing in Benko describing moving the beam during solder reflow. It would not be obvious to combine Meyer and Benko and then modify Benko to actually move the laser across the flex

See Abs.

circuit during reflow. As discussed previously, Meyer actually teaches away from utilizing a laser that is moved across the flex circuit, rather it describes redirecting a stationary laser or actually turning the laser off and moving it to the next trace. Therefore, the combination of Meyer and Benko does not anticipate claim 16, and it would not be obvious to modify the combination to meet each and every limitation of claim 16. Claims 17 and 18 depend from allowable claim 16. Therefore, Applicants respectfully request that the § 103(a) rejection of claims 16-18 be withdrawn.

Claim 19 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Meyer in view of Benko and further in view of U.S. Pat. No. 6,392,291 to Corisis ("Corisis"). The Examiner claims that Meyer and Benko teach the reflow soldering as described with respect to claims 16 and 18, but Meyer is silent as to the use of flux in the process. The Examiner claims that Corisis teaches that a flux is used prior to the application of solder to a bond pad to clean off surface oxides and performs a tacking function, all of which lead to improved solder wetting and an improved bond. The Examiner claims that it would be obvious to modify the process of Meyer and Benko by using a flux because Corisis teaches that a flux improves bonding. Applicants respectfully traverse.

Claim 19 is dependent on allowable claim 16, and therefore, Applicants respectfully request that the § 103(a) rejection of claim 19 be withdrawn.

III. Obj ction to Claim 20

Claim 20 was objected to under 37 CFR 1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claim 20 has been cancelled without prejudice, therefore the objection to claim 20 is moot.

IV. Claims 21-23

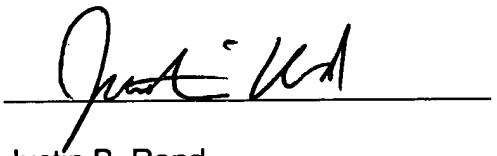
Applicants note with appreciation that claims 21-23 have been allowed.

V. Conclusion

In conclusion, Applicants have overcome each of the rejections and objections. The application is therefore in condition for allowance and early notification of allowance is respectfully requested. If, for any reason, the Examiner believes that the amendments and remarks do not put the claims in condition for allowance, the undersigned attorney can be reached at (312) 245-5394 to resolve any remaining issues.

A marked-up version of the changes made to the claims by current amendment is attached (APPENDIX A).

Respectfully submitted,



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APPENDIX A

Version with markings to show changes made

Claims

2. (Amended) A method for soldering plastic flex circuits by diode laser, said method comprising the steps of:

providing at least a first flex circuit and a second flex circuit composed of polymer flex substrate, each having a top and bottom side, and each with at least one contact trace embedded therein;

providing an area of solder on said at least one contact trace of at least one of said first flex circuit or said second flex circuit;

positioning said first flex circuit and said second flex circuit such that said at least one contact trace of each flex circuit are in substantial alignment;

positioning at least one laser beam to heat said at least one contact trace to melt said solder and fuse said contacts; and

[wherein] moving said laser beam [moves] across said flex circuits.

Please cancel claims 1 and 20.